REMARKS

Claims in the Application

Claims 39 through 45 and 51 through 57 are pending in this United States Patent Application. Claims 55 through 57 are withdrawn from consideration as being drawn to a non-elected invention. Thus, claims 39-45 and 51-54 are being prosecuted in this Application.

Elections/Restrictions

Applicants hereby affirm that an election was made, without traverse, to prosecute the invention of Group I, Claims 39-45 and 51-54.

Accordingly, claims 55-57 are withdrawn from consideration as being drawn to a non-elected invention.

Applicants will cancel claims 55-57, drawn to the non-elected invention, upon the determination that allowable claims are present in this Application. Applicants desire to keep claims 55-57 in a pending status for the purposes of considering the filing of a Divisional Application to prosecute the claims 55-57 drawn to the non-elected invention.

Claims Objection

The Examiner objected to Claim 39 due to an informality.

Applicants have amended 39 at line 5 to delete the word "be" such the applicable phrase now reads --at a selected slope

so as to enable gravity * * * --.

With this amendment to claim 39, claim 39 is now in proper grammatical format and the objection of the Examiner to claim 39 has been overcome.

Rejection of Claims 39-45 and 51-52

Under 35 U.S.C. § 103(a)

The Examiner rejected claims 39-45 and 51-52 under 35 U.S.C. § 103(a) as being unpatentable over van de Berg (US 5,792,964) and further in view of Kobayashi et al (US 5,421,210).

In making this rejection, the Examiner states as follows;

> Van de Berg discloses the claimed flow meter except it is not positively disclosed that the liquid flow level is less than the cross-sectional diameter of the conduit containing the flow meter. Van den Berg's milking system has a milk flow device 10 positioned between a milk claw and a pipeline for transporting and measuring the properties of the flow, comprising first and second sensors defined as elements 12, Figure 2, and a third sensor 15 for measuring conductivity. The first and second sensors 12 determine the flow rate by finding the cross-

sectional area of the milk flow and then determining how much milk passes the space in between the two sensors 12 in a certain period of time (van den Berg, col 4, lns 5-16). Van den Berg does not discuss the height or level of flow through the conduit and thus does not specify how such a situation is handled by the flow device. Kabayashi [Kobayashi] discloses a milk flow meter, in the same field of invention, having the capability to measure the flow rate of a fluid passing through said meter even when a varying liquid level. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize Kobayashi's sensor or electrode device in van den Berg's milking system to provide a flow meter that is more adept to measure fluid flowing at different levels in the conduit.

Regarding clams 42-45, van den Berg shows the milk flow device 10 to be at an angle of inclination (van den Berg, Figures 1 and 2) however it is not positively disclosed what that angle is. It would have been obvious to one

> having ordinary skill in the art at the time the invention was made to alter the angle between 25-35 degrees, encompassing 10-80 degrees, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

The rejection of claims 39-45 and 51-52 under 35 U.S.C. § 103(a) as being unpatentable over van den Berg (US 5,792,964) and further in view of Kobayashi et al (US 5,421,219) is respectfully traversed for several important reasons.

First, Applicants disagree with the Examiner's initial statement: " Van de Berg discloses the claimed flow meter * * *" for the following reasons.

The milk quantity meter of van den Berg (US 5,792,964) is located between a teat cup 2 and a milk glass 3. The milk flow being measured is between the teat cup 2 and the milk glass 3. The milk flow is a series of pulses as a result of the action of pulsation system 8. Since there are four (4) teat cups per milking apparatus, four (4) separate milk quantity meters are required to measure the quantity of milk from the four teat cups

thereby measuring the quantity of milk obtained from separate udder quarters of the animal.

The pulses of milk are passed by separate milk line 4 to the milk glass. In operation and as clearly known to persons having ordinary skill in that art in this type of milking apparatus structure, the milk pulses completely occlude the entire cross-section of milk line 4. Van den Berg (US 5,792,964) does not anticipate, disclose, suggest or teach that the milk line 4 could have a different cross-section, which cross-section would need to be of sufficient diameter to prevent or inhibit occlusion of the milk line 4 by the pulses of milk from the teat cup.

Accordingly, in the formula discussed by Van den Berg (US 5,792,964) commencing at column 3, line 63 to column 4, line 17, and specifically at column 4, lines 4 and 5 thereto, the element A is the cross-section perpendicular to the direction of milk flow and in the embodiment of the milk quantity meter disclosed by van den Berg (US 5,792,964), A is fixed at the cross-sectional area of the milk line 4. The formula itself does not anticipate a varying cross-sectional area for A.

As such and in order to measure the pulses of milk from the teat cup 2, it is necessary to have two (2) conductive junction tubes and one (1) non-conductive junction tube to render the

milk quantity meter operative. This is specifically discussed by van den Berg (US 5,792,964) at column 3, lines 44 through 60, to wit:

> In the embodiment shown (FIG. 2), each of the electrodes is constituted by a junction tube 12, which junction tubes are kept at a mutual distance 1 from each other by means of a further junction tube 13 made of an electrically non-conductive material. The internal diameter of this junction tube 13 corresponds to that of the junction tubes 12 so that junction tubes 12 and 13 constitute together one tubular body having a uniform internal diameter.

Thus, the volume of <u>each separate pulse</u> of milk must be measured by this structure having three junction tubes in order to calculate total milk flow from one (1) teat of an utter to which teat cup 2 is affixed.

In order to obtain a total milk flow of pulses of milk from a teat cup 2 representing one (1) utter of an animal, van den Berg (US 5,792,964) obviously uses a microprocessor 19 to perform an integration of the fluid flow from all of pulses to derive the total milk flow from a single teat of an utter. In order to obtain total milk flow from a milk claw from four (4)

teats of an utter, the microprocessor would need to total the integrated fluid flow from all of pulses from all four (4) teats of an utter.

In the present invention, the milk flow meter is connected between the milk claw and the pipeline and measures the continuous milk flow from the output of the milk claw, which milk flow occurs in a manner so as to not occlude the milk line.

This is discussed in the specification at lines 8 through 20, Page 23, as follows:

> The milk claw 60 includes an outlet 64 having side walls and preferably has a predetermined cross-sectional area selected to be in the range of: (i) a minimum cross-sectional area for maintaining at all milk flow rates a substantially uniform laminar flow of milk therethrough and for concurrently providing a stabilized continuous vacuum in a vacuum channel between the laminar flow of milk and the interior walls of the outlet 64; and (ii) a maximum cross-sectional area equal to about 1.5 times the minimum cross-sectional area of the outlet 64.

Accordingly, the present invention discloses and teaches that the cross-sectional area is selected to have "a minimum

cross-sectional area for maintaining at all milk flow rates a substantially uniform laminar flow of milk therethrough and for concurrently providing a stabilized continuous vacuum in a vacuum channel between the laminar flow of milk and the interior walls of the outlet 64."

Thus, the milk flow meter of the present invention is located at a completely different location in a milking system, e.g. between the outlet of a milk claw which collects milk from four 940 teat cups and produces a continuous flow of milk which does not occlude the milk line, that the milk quantity meter of van den Berg (US 5,792,964), e.g., between each teat cup and the inlet of a milk glass.

In addition to the above, the Examiner's attention is respectfully direct to the specification commencing at Line 16, Page 6 to Line 23, Page 7, which discusses van den Berg (US 5,792,964) at length, to wit:

> Prior art milk flow meters do not have a cross-sectional area sufficiently large to pass a continuous milk flow without occluding thereby contributing to flooding and interruption of the vacuum.
>
> A milking system including a milk quantity meter is disclosed in United States Patent

5,792,964. In one embodiment of a milk quantity meter disclosed in United States Patent 5,792,964, the milk quantity meter is located between a teat cup and a buffer vessel, such as a milk glass, to measure a pulsating milk stream from an individual teat which is obtained pulsationwise and depending on the pulsation frequency at which the milking takes place thereby measuring the quantity of milk obtained from separate udder quarters of the animal.

In United States Patent 5,792,964, the milk quantity meter measures the milk flow by integrating the pulses of milk in the fully occluded conduit between the teat cup and milk vessel. The milk quantity meter includes three electrically conductive elements, two of which measure the resistivity of the milk filling the conduit and a third electrode measures the conductivity of the milk. The pulsed milk flow is determined by the area of the conduit filled by the milk and the time required for a milk

pulse, which fills the entire conduit, to travel between the two electodes.

In a second embodiment of a milk quantity meter disclosed in United States Patent 5,792,964, the milk quantity meter is located in the pipeline between the buffer vessel, such as a milk glass, and a milk tank. The buffer vessel is used to effectuate a separation between the air and milk. The total quantity of milk can be determined accurately by means of only one quantity meter by discharging the milk from the buffer vessel to the milk tank in one single pulsation wherein the quantity meter is obviously fully occluded by the milk filling the meter due the maximum flow arising from a single pulsation of milk (Underlining added for emphasis).

For all of the above reason, Applicants agree with the Examiner's ultimate conclusion that "Van den Berg does not discuss the height or level of flow through the conduit and thus does not specify how such a situation is handled by the flow device."

Turning now to the Examiner's characterization of Kobayshi et al (US 5, 421,210), the Examiner stated as follows:

> Kabayashi [Kobayashi] discloses a milk flow meter, in the same field of invention, having the capability to measure the flow rate of a fluid passing through said meter even when a varying liquid level.

Applicants respectively take issue with the Examiner's characterization of Kobayshi et al (US 5, 421,210) for several important reasons.

One reason is the Kobayshi et al (US 5, 421,210) does not disclose a milk flow device, but discloses a capacitance type electromagnetic flowmeter and the disclosed fluid or liquid is water [Kobayshi et al (US 5, 421,210, column 8, line 40].

Further, the Examiner appears to imply that Kobayshi et al (US 5, 421,210) has the capability to measure the flow rate of a fluid passing through the capacitance type electromagnetic flowmeter as a function of a varying liquid level in a closed tube.

A careful reading of Kobayshi et al (US 5, 421,210) discloses the following description set forth at column 6, lines 50 through 52:

> The description thus far made assumes that the inside of the flow tube is filled with fluid flowing therethrough (Underlining added for

emphasis).

Thus the description relates to a filled flow tube depicted in Fig 3. There is no varying liquid level in the closed tube of Fig. 3.

Kobayshi et al (US 5, 421,210) then goes on to state the following at column 6, lines 52 to 60:

> The theory can also be applied to cases wherein the inside is not completely filled with liquid and there exists a free liquid surface, and also to cases wherein the flow tube is formed by an open conduit, by considering the process of derivation of the fundamental equation. In these cases, if the flow meter is so designed that the magnetic field is perpendicular to the free liquid surface, it is not necessary to measure the potential at this portion (Underlining added for emphasis).

The discussion of the embodiment of Fig. 11 (an open conduit) in Kobayshi et al (US 5, 421,210) at column 10, lines 51 through 58 describes how the above theory is applied, to wit:

> Moreover, in the inventive flowmeter, the length of each detecting electrode taken axially of the

> flow tube is proportional to the cosine of the angle made between a normal to the wall of the conduit and an axis vertical to both the axis of the flow tube and the magnetic field. Thus, flow rates in the open conduit can be made independent of variations in the level of the liquid and are not affected by flow velocity distribution
>
> (Underlining added for emphasis).

As such, the fluid flow measurements made by the capacitance type electromagnetic flowmeter of Kobayshi et al (US 5, 421,210) do not measure fluid flow as a function of variations of the liquid levels, but does just the opposite, namely measures flow rates independent of variations in the level of the liquid and are not affected by flow velocity distribution.

This is accomplished by designing the flow meter so that the magnetic field is perpendicular to the free liquid surface.

Thus, in a closed tube structure of the milk line 4 as disclosed in van den Berg (US 5,792,964) and to use the teachings of Kobayshi et al (US 5, 421,210), it would be necessary to designing the flow meter so that the magnetic

field is perpendicular to the free liquid surface and to add a magnetic field.

The teachings of the present invention do not require that the flow meter be designed for use with a magnetic field and it is not necessary to utilize a magnetic field that is perpendicular to a free liquid surface.

Regarding clams 42-45, it is noted that van den Berg shows the milk flow device 10 to be at an angle of inclination (van den Berg, Figures 1 and 2).

Claims 42, 43, 44 and 45 are dependent claims based on claims 39, 42, 43 and 44, respectively, all of which are essentially dependent on independent claim 39.

Claim 39, as amended, is verily believed to define patentable subject matter for all of the reason set forth above. As such claims 42-45 are being used to vary the scope of what Applicants believe to be an allowable independent claim and Applicants are not relying on the milk flow device being at an angle of inclination for patentability.

For all of the above reasons, neither van den Berg (US 5,792,964) alone, or Kobayshi et al (US 5, 421,210), alone or van den Berg (US 5,792,964) in view of Kobayshi et al (US 5, 421,210) anticipate, disclose suggest or teach the

inventions as claimed in claims 39-45 and 51-54.

Disclosure of Related Issued United States Patents

Applicants call to the attention of the Examiner the issuance of the following United States Patents:

Patent Number	Issue Date	Serial No. of Parent, if applicable
6,604,053	08/05/03	None (Note: This Application was filed Feb. 13, 2001 which is the same filing date as application Serial No.: 09/782,849, filed Feb. 13, 2001, now Pat. No. 6,722,208
6,799,474	10/05/04	Division of application Serial No.: 09/782,849, filed Feb. 13, 2001, now Pat. No. 6,722,208
6,722,208	04/20/04	None (Note: This Application was assigned Serial No. 09/782,849 and had a filing date of Feb. 13, 2001)

It is respectfully called to the Examiner's attention that this present Application, Serial No. 10/688,036, claims priority as a Divisional Application from Serial

No.: 09/782,849, filed Feb. 13, 2001, now United States Patent No. 6,722,208

The above issued United States Patents cover inventions related to the invention covered by claims 39-45 and 51-54 being prosecuted herein. The reasons for bringing this to the attention of the Examiner are: (i) To support the arguments set forth herein that the inventions covered by claims 39-45 and 51-54 are patentable in that related inventions including the invention of United States Patent Application Serial No.: 09/782,849, filed Feb. 13, 2001, now United States Patent No. 6,722,208, from which this Application claims priority, have been deemed to define patentable subject matter; and (ii) to request that the Examiner determine that no rejection of the claims is required herein based on the judicially created doctrine of double patenting and, accordingly, no terminal disclaimer is required to be filed herein.

As a convenience to the Examiner, copies of the above-identified United States Patents are enclosed herewith and identified as Exhibit A.

Allowable Subject Matter

Applicants acknowledge and appreciate that the Examiner has determined that allowable subject matter is

present, namely, that Claims 53-54 are objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants verily believe that base claim 51, the independent claim from which claims 53 and 54 are essentially based, is allowable for the reasons set forth above. If independent claim 51 is ultimately determined to define patentable subject matter, then claims 53-54 would then likewise be deemed to be allowable and would not have to be rewritten.

For this reason, Applicants have elected to not rewrite claims 53-54 at this time.

SUMMARY

Applicants' have amended Claim 39 to overcome the objection of the Examiner.

Claims 39-45 and 51-54 are verily believed to define patentable subject matter over the cited art for the reasons set forth above.

For all of the reasons set forth above, claims 39-45 and 51-54 clearly define patentable subject matter over the cited art including the art cited by the Examiner.

The Examiner is respectfully requested to determine that claims 39-45 and 51-54 are patentable and issue a Notice of Allowability and a formal Notice of Allowance.

Respectfully submitted,

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